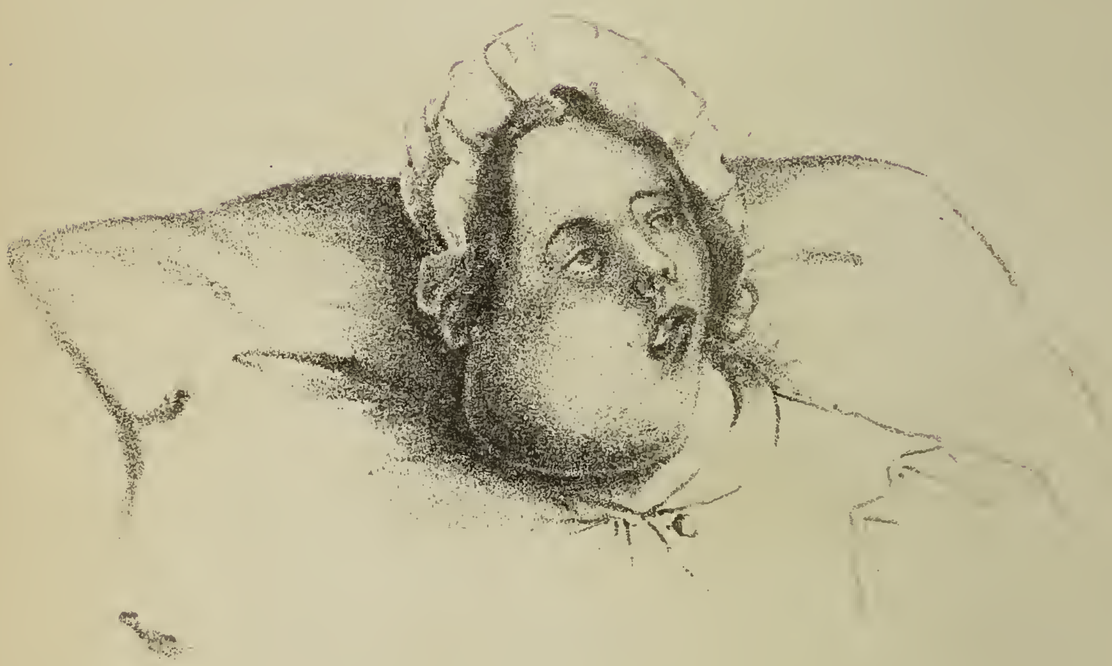

OSTEOSARCOMA.

B C Brodie

CASE OF OSTEO-SARCOMA OF BOTH JAWS,

IN WHICH AMPUTATION AT THE JOINT WAS EFFECTED, AND VERY CONSIDERABLE PORTIONS OF EACH BONE WERE REMOVED BY OPERATION.

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CASE OF

OSTEO-SARCOMA, &c.

Mr. Samuel Cooper, in his highly valued Surgical Dictionary, states that amputation of considerable portions of the jaw bone is one of the achievements of modern surgery ; that it was first performed by Dr. Mott, in America, and has since been accomplished by several of the most distinguished English and Foreign surgeons. It may, therefore, though still a new, be considered as an established operation, and ~~as~~ forming one considerable step in the advancement of operative surgery. But, as in all the instances I have seen recorded on this subject, only portions of one jaw have been removed, ~~and~~ I am induced to lay the following case before the Provincial Association, as it presents one of the most extensive and complicated instances I have met with in my researches ; the disease not only involving both jaws, but also having spread its ravages to the articulation. Hence this case required, in the operation attempted for its cure, not only the removal of very considerable portions of each jaw, but likewise amputation at the joint. It has also suggested many other practical considerations, the relation of which, it is considered, may not prove unacceptable to the profession, more particularly as this department of surgery is, in many respects, still in its infancy, not only with reference to the operative part, but to the pathology, diagnosis, and prognosis.

A very able and intelligent provincial surgeon, James Barlow, Esq. of Blackburn, Lancashire, has lately well observed, "It is evidently the nature of all morbid phenomena, to be liable to a change of structure, thus, a tumour, when bearing in itself no appearance of malignity in its primary state, will eventually assume a more formidable and alarming aspect; and if its removal be too long delayed, will often prove a source of regret to the patient, whilst he, on the one hand, from motives of timidity, and the surgeon, on the other, through a mistaken fear of risking his reputation, by the hazard of an operation, lulls the patient into a state of supineness: thus they implicitly combine to deceive each other from day to day, during which time their minds are agitated by a succession of alternate hopes and fears, till, by the slow but unnoticed lapse of time, the disease becomes inveterate and incurable." This lamentable effect of surgical procrastination, I have witnessed in a great variety of instances. The following extreme case is one more to be added to the list of those unfortunate and almost inexplicable examples of delay on the part of the patient. It, however, affords the pathologist the opportunity of observing the result and morbid growth of this denomination of tumours.

CASE.

Margaret Hunt, æt. 23, of a scrofulous habit, sallow complexion, and with a very feeble and limited intellect, was admitted into the Bristol Infirmary, 27th January, 1831, with a large and prominent tumour of the left side of the face, extending over both jaws, and appearing to fill up the cavity of the mouth; elevating and pushing before it the integuments of the cheek. The resistance which the cheek offered, repressed and flattened the surface of the tumour, and in consequence of this resistance, a portion of its lobulated structure was forced towards, and partly protruded at, the angle of the mouth between the lips, in the manner represented in the plate. The integuments, also, both of the nose and eye, were disfigured from the same cause; forming, together, a very striking and fearful deformity of the face. The tumour extended from the upper to the lower jaw, to the latter of which it adhered so firmly, as to render it completely immoveable, so that the patient could not masticate, and could scarcely articulate, being only enabled to answer questions put to her, by indistinctly mumbling yes or no. In this state she was compelled to live upon fluids, and even these were with difficulty swallowed, deglutition being much impeded by the pressure of the tumour upon the internal part of the mouth. Her friends stated that she had been always of a weakly constitution, and that the swelling commenced when she was between eleven and twelve years of age, in consequence of a chill taken from sleeping in a room with the window broken; and that on the following morning, the left side of the face and the eye were swollen to a great degree, which, in the course of some days, subsided; that soon after, a hard swelling appeared about the middle of the cheek, since which time it had been gradually increasing to its present size; that it had given her pain; that several of the teeth, on the affected side, had occasionally dropped out, and that those which remained were loose and displaced, accompanied with a continued dribbling of a fetid discharge from the mouth. They also replied, to my inquiries, that she never had had a tooth extracted, not having been subject either to toothache or gum boils: that latterly there had been frequent and copious bleedings from the mouth; and that no other remedy had ever been applied than a bread and water poultice, and then only when there was more pain than usual, and that it generally afforded relief.

Upon accurately examining the internal part of the mouth with the finger, it was ascertained that the tumour originated in the superior maxillary bone, which corroborated the patient's statement; and that in its progress it had gradually extended backward into the palatine portion of the mouth, and been pressed forwards and downwards upon the lower jaw by the action of the cheek; where, by its long continued growth and increasing pressure, it had produced extensive absorption of that bone. The alveolar border and processes of both jaws, were nearly all removed on that side of the face; in the upper jaw not a tooth was left; in the lower only a few remained, loose and buried in the medullary matter of the tumour. One rather unusual, and, with a view to an operation, favourable circumstance was, that the tumour prevented the closing of the mouth in consequence of its insinuating itself between, and adhering to both jaws, so as to render them fixed, to a certain degree, asunder; this circumstance afforded the opportunity of exploring, by the finger, the inside of the mouth, by which means it was ascertained that no adhesive, ulcerative, or fungating process had taken place between the surface of the tumour and the cheek, although they were in close contact, and, as may be supposed, firmly pressed together. The fact of finding the cheek free, healthy, and unadhering, so as to allow the finger to pass between it and the tumour, and over its surface, quite up to the articulation, was an unexpected feature amidst such a mass of disease, and contributed to encourage the prospect of the projected operation. The elastic properties of the cheek had caused it gradually to yield, and accommodate itself to the growth of the tumour, in a manner similar to that which the parietes of the abdomen so remarkably exhibit in cases of dropsy. The glands of the neck were found free from disease.

Externally, the tumour gave the sensation of firmness, from the tension of the cheek over it; but internally it felt soft and yielding, about the consistence of brain. The shape of the tumour may be conceived from the above description; with respect to its size, it was about equal to a large orange.

From this statement it is evident the tumour was of too extensive and serious a nature to be trifled with, and that no benefit could be derived from any remedy, except by such means as should destroy its texture, and at the same time prevent a renewal of its growth. The knife and actual cautery appeared to be the only resources advisable; the knife to remove the tumour, and the cautery to destroy that part of the bone in which it might be found imbedded. I was sufficiently aware of the tendency of the morbid action I had to contend with, and of its disposition to spread into surrounding parts, whatever might be their nature or tissue; and from experience, that operations undertaken for this purpose, in many instances had been followed by relapses; at the same time, I had the consolation of knowing that tumours, considered of the most malignant, threatening, and hopeless aspect, in the opinion of some very eminent surgeons, had, as a forlorn hope, been removed with complete success: an instance of which has lately been given by Mr. Lawrence, in his very interesting paper, published in the 17th vol. of the Medico-chirurgical Transactions: so difficult and uncertain, sometimes, are both the diagnosis and prognosis of this class of diseases. I reflected, also, that in the opinion of the first authorities there were some features that might, at least, be considered not unfavourable in this case, namely, that the fungating process, which so frequently supervenes in this denomination of tumour, had not taken place; that constitutional derangement had not made so much progress as might have been expected, considering the extent and long duration of the disease; and, above all, that the neighbouring glands and the integuments immediately over the tumour remained perfectly healthy and uncontaminated. Under this impression, I laid the above view of the case before my colleagues. *In consultation*, it was determined to endeavour to remove the tumour from its base and attachments, and to destroy, if practicable, the surface of the bone from whence it originated. A few days previously to the operation, I again accurately examined the parts, and removed the few remaining teeth out of my way. No hæmorrhage followed. The teeth were sound.

On deliberate consideration, I determined to avoid the preliminary step, or rather, I ought to say, important operation, which many eminent surgeons have previously adopted in cases less severe, that of first passing a ligature round either the common or external carotid trunk, and tying it finally before the intended operation, or leaving it loose under the artery, to act in imitation of the tournaquet in case of necessity. I decided upon trusting to the able assistance I was sure to obtain from my colleagues; upon securing branches as they were divided, and employing pressure or the actual cautery; at the same time, I prepared myself to secure the common trunk, if circumstances should ultimately require it. Further reasons for declining this superadded operation will be mentioned in the few practical observations which will terminate this paper.

Feb. 16.—The patient was laid horizontally on the table, on the right side, the head moderately elevated on a firm pillow, so as to place the cheek in the most favourable position for *the operation*. Two fingers were introduced at the angle of the mouth, between the tumour and the cheek, in the direction of the articulation; the integuments were then freely slit up between them to the lobe of the ear; another incision was then carried from the infra-orbitary ridge across the centre of the first incision, down to the angle of the lower jaw. It was here necessary to tie some branches of the facial artery, which bled rather freely. The flaps of the crucial incision were then reflected, which fully exposed the external and irregular lobulated surface of the tumour, and afforded, also, the opportunity of tracing its base and attachments. The base of the tumour was found to occupy the palatine and maxillary portion of the upper jaw, and in its extensive growth its head had been forced down and attached to the ridge of the lower jaw, nearly as far as the symphysis, extending along the whole of the alveolar border nearly in a horizontal line from the mental foramen to the condyloid process, the whole of which portion was discovered to be either absorbed or in a state of caries from the long continued pressure of the tumour. In fact, the tumour had so worked its way across the lower jaw, both inwards and outwards, that it was found buried in its substance, and, consequently, absorption of its body had been going on for some time, on both sides of the bone. The substance of the tumour was next separated by the knife and fingers, from its base and adhesions; this occupied a considerable time, in consequence of its various sinuations, as it had penetrated in every direction where it could find access. When this was effected, an extensive irregular surface of bone was found in a state of caries, extending, in the upper jaw, from the pharynx across the palate to the malar bone.

Not the least vestige of the thin walls of the antrum remained. Fortunately the floor of the orbit was left uninjured. With the assistance of Liston's bone cutter, small saws, &c. every portion of diseased bone was taken away that could be safely removed, and the general surface scraped, as carefully as possible, with the knife, it being intended, finally, to apply the actual cautery over the whole plane of the diseased bone. Having accomplished this tedious and difficult part of the operation, ample room was found for amputating the lower jaw at the articulation; caries having extended, as before stated, from near the symphysis along the whole of the upper margin to the joint. This extensive line of bone was then sawed off, except the condyloid process, which was afterwards easily disarticulated, and removed with Liston's bone cutter, having first divided the fore part of its capsule, and also the temporal muscle from the coronoid process. This important and generally intricate part of the operation, was facilitated by the previous removal of all the teeth and alveolar processes.

During the operation, no alarming hæmorrhage occurred, and after the branches of the facial artery had been secured, but little interruption was experienced from loss of blood.

The operation was necessarily long and tedious, occupying about three quarters of an hour, part of which time was spent in allowing the patient to rest and change her position, and in giving some cordial to relieve weariness, rather than an actual state of fainting. In consequence of the exhausted state of the patient, by the lapse of time, I was urged, by those around me, from the best motives, to put aside the intention of using the actual cautery. I regret that there should have appeared a necessity for this omission, as there would otherwise have been the satisfaction of reflecting that every means had been exhausted in trying to eradicate the disease; for it is too well known that, if not entirely destroyed, this description of tumour repullulates with greater facility, in consequence of the stimulus which the mechanical injury of the knife applies. The surface of the wound was cleaned, and the flaps of the cheek were replaced, and brought into neat apposition by three sutures, over which adhesive straps were placed, and retained with a light bandage. No unpleasant symptoms afterwards occurred. On the fourth day the dressings were removed; the external incision had completely united, with very little deformity, or falling in of the cheek. The patient was able to swallow, speak, and breathe easily, and in the course of a fortnight, the dressings having been discontinued, she walked about the ward, and was evidently convalescent. By this time she began to eat soft substances, and, in the course of a month, masticated almost as well as usual with the other side of the mouth, from which there was now no discharge, After this, I kept her in the house for about three weeks longer, both for security and observation, when both herself and friends became impatient for her return home, which was assented to, and she was dismissed, April 5th, quite restored to a healthy appearance; exactly seven weeks having elapsed from the day of operation. Strict injunctions were given to the patient as to the future care of herself, with directions to return to the house should there appear, at any time, a renewal of the disease, or any uneasiness of the mouth or cheek.

Anatomical character of the Tumour after removal.

On examination, its lobulated shape had been mostly destroyed, in consequence of considerable portions having been necessarily torn apart by the finger during the operation. Its substance throughout possessed the common homogeneous structure of medullary matter, being composed of irregular masses inclosed and separated from each other, more or less completely, by thin membranous septa, bearing, in colour and consistence, a near resemblance to brain. On cutting it into slices, a few blood-vessels were divided, from the orifices of which oozed small portions of blood. In fact, it possessed all those anatomical appearances usually characterising medullary sarcoma, with which every practical surgeon is familiar.

From this description of the structure of the tumour, it will, as I am aware, at once appear to the correct nosologist, that I have been quite inaccurate in terming this a case of osteo-sarcoma ; it is manifest that the title medullary would more clearly have designated its true character ; but, as to all the cases I have seen recorded of this disease, to several of which I shall hereafter refer, the common name of osteo-sarcoma has been given ; and, as there is no other, that I have observed, under which it has been classed, I did not presume to attempt any change, custom having sanctioned the general acceptation of the term adopted ; and every practical surgeon being familiar with the disease under that appellation. I reserve, however, to myself, the opportunity which I shall have at the conclusion of this paper, of offering a few remarks on the general confusion, nay, contradiction, that exists between the most distinguished English, French, and German nosologists, with respect to the arrangement and classification of tumours.

In connection with this subject, I shall cite the opinion of Mr. Lawrence, who observes that "one source of difficulty in deciding on the nature of tumours is, that productions of dissimilar character may be combined in one morbid growth. Striking examples of it are sometimes seen in the tumours of bones. These productions pass under the vague term of osteo-sarcoma, which it would be better to banish entirely from medical nomenclature."

"If we speak of fungus hæmatodes, melanosis, and cancer of bone, of fibrous and osseous growth, &c. our description may be rendered clear and intelligible, and rational rules of treatment may be laid down." Yet, with his usual candour, this excellent writer states, that he has, at present, nothing to offer against those definitions to which he objects.

Again, as another strong instance of the confusion that exists amongst pathologists, the Baron Dupuytren, in his late highly interesting "Clinical Lecture on *Osseous Cysts and their varieties*,"* denominates Cancer and Osteo-sarcoma similar diseases. To illustrate his doctrine, the Professor states that "in the bony tissues there frequently are developed tumours, generally of a fibro-cellular character, that it appears to be a new formation; but what is remarkable, the bone is neither swollen nor softened, it is merely thinned away. This point is of the greatest importance to be recollected, as we shall hereafter find in treating of the diagnosis of these diseases." M. Dupuytren then introduces the case of a little girl, æt. 7, with a swelling of the inferior maxillary bone that had attained the magnitude of a clenched fist, and remarks that "at the first aspect, this disease might have been considered an osteo-sarcoma. In fact, it was developed at the expense of the superior maxillary bone, which appeared to be softened. Now we know that it is a characteristic mark of cancerous diseases, to produce a swelling and softening of the bones." The lecturer afterwards adds his doubts on the subject, and ventures to hope that it is only "the developement of a fibrous substance in the superior maxillary bone." He then continues, "I should not be astonished, however, if the tumour had changed its nature, for these fibro-cellular substances are extremely prone to degeneration, and the cases then become very embarrassing. It would, doubtless, have been better if this child had been brought to us some months since, but the enormous size of the tumour does not permit us to lose more time. Were the patient abandoned to the disease, it would inevitably degenerate into carcinoma." Two days afterwards the Baron operated partially on this case, and on the following completed his operation: the final result is not given. M. Dupuytren next mentions the nature of the contents of these osseous cysts. "The products contained in cysts of this kind are very various. They may be either solid or liquid;

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* Lancet, No. 482, p. 257. Med. Gaz. No. 274, p. 744.

generally they are formed by a fibro-cellular matter, but sometimes serosity is found, either alone or mixed with fibro-cellular substance, with mucosity, adipocerous substance, hydatids, purulent or gelatinous matter, teeth, &c." M. Dupuytren's early pathognomic sign of these osseous cysts, is a feeling of "crepitation" of their parietes, "like rubbing paper or dry parchment between the fingers." In its advanced or degenerated state it produces caries by absorption, and fills up the cavity with its own substance.

I trust the Society will not consider me to be trespassing when giving the Baron's diagnosis and prognosis, as I am desirous not only of bringing the subject of this disease fully and fairly before the profession, but also of introducing this distinguished surgeon's nice discriminations on so important a branch of surgical pathology.

"The *diagnosis* of bony cysts requires much skill and experience, but the difficulty is partly removed when osteo-sarcoma is not concerned. It is right, then, to insist here on the diagnosis of this kind of tumours, and especially to establish the differences which exist between them and the osteo-sarcomata, with which, on a superficial examination, they may be confounded, and from which it is so important that they should be distinguished.

Osteo-sarcoma declares itself from the first, by lancinating pains, by varicose tumefaction, by the simultaneous alteration of the soft and hard parts in the vicinity, by their fungous degeneration, and numerous inequalities of surface. In the *osseous cyst*, on the contrary, the surrounding parts do not participate in the disease, their surface is smooth and equal, and their progress unaccompanied by pain. The *osteo-sarcomata* are rapidly developed; their bony cysts are slow in their formation; the former are internally traversed with scales and fragments of bone; these fragments never occur in tumours of a different description."

"Here, then, are the practical consequences I derive from this diagnosis. First, osteo-sarcomata and osseous cysts differ essentially from each other. Secondly, osteo-sarcoma is a cancerous degeneration of the bones; the osseous cyst is but the developement of the bone, usually owing to the presence of fibrous substances like those of the womb. Thirdly, when there is no degeneration, we may, by a simple incision, arrive at the tumour, remove it, and feel no apprehension of relapse. But such is not the case with the osteo-sarcoma. In vain you go even to the centre of the tumour; in vain you extirpate even the tumour itself. In this affection you have to deal with a cancerous disease."

"*Progress of the disease.—Causes of its occasional recurrence.*—The *progress* of the osseous cysts is generally slow. In some few instances, nevertheless, they acquire a great developement in a few months; others remain stationary for several years."

"*After an uncertain length of time, they pass into the cancerous degeneration,* especially those whose products are of the fibro-cellular kind. The materials of the cysts, when not entirely destroyed, repullulate with great facility, and have been known to be renewed two or three times."

" *Prognosis.*—The *prognosis* in the osseous cysts is not unfavourable. They are always cured by the operation. They may repullulate, as I have said, when the materials of the secretion are not entirely removed. It is sufficient, however, to know of this tendency to relapse, in order to prevent and combat it. But it is not so when the fibrous substance has undergone the cancerous degeneration, and when the surrounding parts participate in their alteration ; the termination is then fatal. In some cases hæmorrhage may be dreaded. The exploring puncture, however, affords us the means of avoiding this accident, and remedying when it occurs. If the tumour have occasioned considerable deformity, the most skilfully-conducted operation will not prevent some traces of the effects of disease remaining. But this slight inconvenience cannot be balanced with the consequences of the malady when abandoned to itself."

The whole of this very interesting lecture is rendered highly instructive, by the close and acute remarks which always accompany the observations of its distinguished author, who may be considered as at the head of the French school of surgery ; but I cannot help venturing to differ from him on some points. In the first place, the existence of cancer, at seven years of age, is at variance with the doctrines of English pathology : in the next, I am quite inclined to consider these " osseous cysts" as only the primary state or early period of osteo-sarcoma ; and believe that, in its full developement, and in all its modifications, it constitutes the disease so termed : that this does not degenerate, nor is entitled to the name of cancer. And I submit that any able pathologist, who will analytically or critically peruse this author's lecture, would come to the same conclusion. To be more precise, I consider the Baron's expression, "degenerating into cancer," to describe, when interpreted into our pathology, the full developement of osteo-sarcoma.

Another striking instance of the incongruous and confused state of surgical pathology, to which I have alluded, is exemplified with respect to other malignant productions. In Dr. Carswell's very learned researches and discriminations, contained in his paper on melanosis, lately published in the 14th part of the Cyclopædia of Practical Medicine, it is stated that the Baron Dupuytren, who claims the discovery of this disease, terms it "*cancer noir*," his opinion being obviously founded on the *colour* of the tumours, without any regard to their *structure*. In many other instances the same eminent surgeon terms melanosis "*black cancer*," so that, according to his classification, we have soft, hard, black and white cancer. The French and Germans have again confounded fungus hæmatodes with nævus maternus, as well as with the anastomosing aneurism; these two tumours being by them considered as species of the same disease. In fact, foreign surgeons have not yet noticed the strongly marked difference which English pathologists have found to exist between fungus hæmatodes, melanosis, carcinoma, encephaloid, and other malignant growths.

Having brought forward these important discrepancies in classification, with a view to show both how confused and difficult it is, under the present vague arrangement of morbid growths, to give any-thing like a correct natural history and definition of tumours, I shall next lay before the association all that I have been able to glean with respect to the disease that is the subject of this paper, in the hope of being able to clear, in some degree, the species of malignant tumour above mentioned, from many of the erroneous, vague, and indefinite descriptions with which the subject is perplexed. I am additionally induced to offer this information, from observing that osteo-sarcoma of the jaw, is a species of tumour which has been generally ill defined; and that under this term has been ranged a great variety of extraordinary and anomalous diseases. In pursuance of this object, I shall, for the present, confine myself chiefly to defining osteo-sarcoma and contrasting it with cancer; osteo-sarcoma having, in the opinion of many writers, a close affinity to, if it is not identical with, cancer. Cancer is the ancient name under which all malignant products, by the older surgeons, have been classed, and which several distinguished modern pathologists seem still inclined to retain; for under the generic term "cancer," every description of intractable and malignant disease has been included. This inattention and want of care amongst several eminent authors, to arrange facts systematically, is much to be lamented, as tending to lessen the value and importance of more correct pathological principles. A new æra in this department of medical science commenced with this century; and that it is daily making great and beneficial advances, I need only refer for proof to the articles that have already appeared on this subject in the "Cyclopædia of Practical Medicine," by Drs. Kerr and Carswell; to Mr. Burn's and Mr. Liston's Principles of Surgery; to Cloquet's Surgical Pathology; and to the unrivalled descriptive History and Plates, representing diseased structure, now in the course of publication by Drs. Hope, Hooper, and Carswell, whose learning and research are of the highest order.

To return from this, I trust pardonable digression, it is presumed (for the reasons just mentioned, viz. the endeavour to remove some portion of the obscurity in which this subject seems involved) that some advantage may be derived from a concise and practical definition and contrast of osteo-sarcoma and cancer; and that due allowance will be made for the hazarding such a comparison as is obtainable and consistent with the circumstances of the two diseases, and the present state of our knowledge respecting their individual character.

The term osteo-sarcoma of the jaw is employed by most authors to designate a morbid product, the distinctive character of which consists, more or less, in its resemblance to brain, fat, &c. It is true that the species of tumour which passes under this designation is sometimes found to consist of other materials either more or less hard, pulpy, or soft, such as fibro-cellular, fibro-cartilaginous matter, coagulated blood, serum, &c.; but these varied substances are generally to be found rather as intermixed with the original medullary structure of the tumour, than essentially belonging to it; and may be more properly considered as superadded, or converted materials, arising from occasional inflammation excited in the parts, after the tumour has been formed, than as composing its original and primary formation. I therefore conceive that under the term osteo-sarcoma, according to the present nosology of all English practical surgeons who have recorded cases of this nature, are included all those depositions which pass under the common epithets of osteo-sarcoma, cancer of the alveolar membrane, soft cancer, medullary exostosis, fungus medullaris, medullary sarcoma, medullary cancer, encephaloid, cerebriform, fibro-cellular, fibro-cartilaginous, formations, &c. &c. These malignant productions admit of almost endless modifications. The time may come, and I trust we are daily advancing towards it, when yet undiscovered knowledge, and new and more direct principles of classification having been devoted to this subject, a clearer and better understood arrangement of morbid tumours may be established; but, in the elegant language of Dr. Conolly, "the day of these triumphs is yet distant."

From this representation, and under our present state of knowledge, osteo-sarcoma may perhaps be advantageously separated into two great divisions; the first to be considered as accidental from a local external cause; the other as arising independently of the direct influence of any local cause, but owing to some great change in the system, which influences the important functions of secretion and deposition, as constituting what is termed an idiopathic disease. These again may be subdivided into the hard, or fibrous, fibro-cartilaginous, fibro-cellular; and into the softer, or medullary, pulpy, and fungus medullaris, &c. &c. Nothing is more difficult than to trace the origin and cause, or to estimate the kind or the extent of the changes which take place in most of the varieties of tumours; changes which are often scarcely perceived, while they are making considerable progress.

In general, the origin of osteo-sarcoma of the jaw, may be traced to unsubdued or mismanaged local imflammation, supervening upon a scrofulous disposition, from whatever cause produced, whether cold, a blow, or mechanical injury to the jaw or teeth, stumps, &c. or other sources of excitement, which occasion the inflammation to extend to the medullary membrane, periosteum, or the internal and cellular structure of the bones of the face. It may attack any of the tissues of the body, but the vascular periosteum that lines the thin walls of the antrum maxillare and the alveolar depressions of both jaws, appears to have the greatest disposition to generate this disease, as it is generally found invested throughout with that fine membrane. The palate bones which form part of the roof of the mouth, the floor and side of the nostrils, the floor of the orbit, are also liable to this disease; but, in most instances, within my observation, these parts become involved in this disease, owing to its spreading by consent of parts, and its contaminating presence in the alveolar membrane, or the antrum. Its growth may be either slow or rapid; it attacks all ages, but chiefly occurs from infancy to forty years of age. Both sexes are liable to it. Its growth is not generally attended with severe pain, unless where it happens to press upon a nerve, or is closely confined within the structure of bone, exciting inflammation and ulceration of that tissue, and thus producing caries. The pain is therefore uncertain and inconstant; sometimes severe, at other times scarcely perceptible, but never of that incessant lancinating, stinging, burning, darting kind which is common to cancer. The neighbouring glands are generally unaffected. Excavation of the bone takes place in proportion as the internal formation of the tumour increases, and excites absorption, first of its cancellated, and ultimately of its more solid osseous structure. Every thing seems to give way to this growth; and the destruction it occasions is immediately supplied by its own development. At its commencement, this malignant growth is bound by the parietes of the bone, which at length yield to absorption from unnatural pressure, and then the tumour, becoming freed from its confinement, spreads in the least resisting direction: this is exemplified in the above case, by the lobulated protrusion at the mouth. The anatomical character and composition of the tumour is of various degrees of consistence and structure. But the principal pathognomonic appearance which this morbid product presents, is, in general, its resemblance to brain, both anatomically and chemically. This appearance is, however, modified, as in all other tumours, according to the locality of its seat or tissue, and the latent predisposition of the patient. This may be said to be its generic character; but graduated deviations occur both in structure, consistence and colour. In some instances, the consistence of the mass is fatty, soft and brainy, or fibro-cellular. In its more advanced stage, the lobes of the tumour sometimes burst, and send out an excrescence or fungus that sprouts more or less exuberantly; the teeth loosen, and fall out occasionally; a fetid, bloody discharge flows from the mouth, sometimes attended with frequent hemorrhage. Hence in this stage it has sometimes been denominated, and confounded with, fungus hæmatodes; but this bleeding, in general, is only occasioned by ulceration and rupture of some of the vessels that nourish and perambulate its substance. I do not deny that fungus hæmatodes may surpervene upon this as well as in any other class of tumours; but I wish to guard against the conclusion, that every tumour that bleeds is to be considered a case of fungus hæmatodes, which is a disease of peculiar organization of vessels.

This is the single or simple description of osteosarcoma, but, like every other morbid growth, it may occasionally exhibit, as supervening diseases, the production of carcinoma, melanosis, and fungus hæmatodes, in the same organ or tissue, and in the same diseased mass.

Diagnosis.—The diagnosis and prognosis of morbid growths are of the utmost importance in surgical pathology. To discriminate those cases where delay and treatment may be recommended,—those in which a great operation may be advisable, and those forlorn cases whose tendency is to inevitable destruction, in spite of every effort; and above all, to be enabled to decide upon those tumours which may be considered inert, local, and not malignant at their commencement; and the period at which they may become malignant and constitutional, is often a most trying undertaking to the experienced and accomplished practitioner. Herein consists the superiority of talent, keen observation and knowledge of the nature of disease. To draw the correct line of discrimination in these instances, establishes the high reputation of the surgeon.

Although I have said that osteo-sarcoma may attack any of the tissues of the body, still it appears to give a general preference to the medullary membrane of the cancellated portion of bone. Cancer, on the other hand, confines itself chiefly to the glandular structure. Osteo-sarcoma is of large, and, sometimes, rapid growth, its developement depending partly on the situation and nature of the tissue in which it originates. The different degrees of consistence from the most fluid and soft, to the most dense and hard, depend, probably, upon the same cause. True cancer, on the contrary, generally diminishes or condenses glandular organs, puckering or drawing in the surrounding integuments, and seldom produces much enlargement. Cancer commences with a stony hardness, accompanied with lancinating, stinging, burning pain. Osteo-sarcoma generally arises without being attended with severe pain, and even when it is severe, the pain is not derived properly from the diseased part itself, but is produced by its pressure on the immediate surrounding tissue. This fact of its not being generally attended with severe pain, in some measure explains why patients allow the disease to proceed nearly to the utmost degree, before they apply for relief. Deformity and inconvenience, and not pain, are too frequently the motives that urge patients to apply for surgical assistance. Osteo-sarcoma is, in general, a disease of early life, occurring mostly during childhood, and seldom later than 40 or 50 years of age. Cancer, on the contrary, seldom commences before the age of 35 or 40; at any rate, it is seldom met with before puberty, and, in particular, is characterised in the female, as occurring at that period when the uterine functions cease; commonly, but most significantly and emphatically, termed the "change or turn of life." A great and serious change is this, as it is too often fatally experienced to be. The tumour of osteo-sarcoma feels spongy, pulpy, elastic, and even soft, in its hardest degree, as compared to scirrhus and cancer, and on being handled, does not occasion that after pain so remarkable in all cancerous affections. Cancer, also, is, sometimes, as it is termed, an hereditary disease. Mr. Burns states that he was acquainted with three sisters who all died of cancer of the breast, which has not been remarked of osteo-sarcoma. In cancer of the lower lip, the sub-maxillary glands are frequently diseased and enlarged, which has not been remarked of osteo-sarcomatous tumours, even of long standing, as is instanced in the case given in this paper. The carcinomatous action extends itself generally along the absorbent vessels and glands of the part originally affected. It seems to prefer this mode of propagating its influence to that of extending itself from one tissue to another. In carcimona the constitutional derangement is greater; the stomach is more particularly disturbed, and the countenance exhibits a more inveterate morbid appearance. The anatomical and chemical composition of these diseased formations, differs, also, as widely as every other subject of comparison. The anatomical and chemical composition of tumours, varies not only at the different periods at which it is examined, but probably is also modified according to the different organs or tissues in which it may originate. Chemistry must be farther advanced before we shall be able to make any great progress in our investigation of this class of diseases. Yet Doctors Bostock, Prout, Marcet, &c. &c. have lately given a great impulse to this branch of chemical anatomy, or, as it is termed, "animal chemistry."

With respect to the separating or distinguishing osteo-sarcoma from scirrhus and cancer, as well as from the other malignant diseases, melanosis, fungus hæmatodes, &c. &c. there can be but little difficulty to the close observer of morbid nature. But when more than one of these diseases supervene one upon another, or where all are developed and combined together under various modifications in the same diseased mass, and in the same organ, tissue, or structure, as is exemplified by Dr. Carswell, in "the production of Melanosis, Scirrhus, Carcinoma, and Encephaloid formations in the same organ, and even in the same diseased mass;" in such instances it is not only difficult in this variety of morbid phenomena, but, perhaps, impossible to arrive, at least in our present state of knowledge, at correct definition. To say, under such combined cirumstances, precisely where one disease begins or where another ends, is not an easy matter. Simultaneous processes, conspiring together for one general effect, though different, are not readily to be distinguished; and though, in this union of morbid formations, their different characters may be observed to be more and more developed, and more apparent by their discordance; still it is more easy to describe, than to mark the line which divides them. But, as M. Bayle observes, in speaking of a *primary disease*, that though it is often met with, united to other organic degeneracy, this coincidence proves nothing more than that these different degeneracies may occur in the same subject, and, sometimes, reciprocally influence one another, though one be not a transformation of the other. "Nature, (in the beautiful and well expressed language of Dr. T. J. Todd,) indeed, never separates things by strong or abrupt lines, though she stamps each with features sufficiently bold and clear to distinguish it from its neighbour. Her system is one continued tissue of great variety and diversity, in which different parts are united together without sign of interruption or joining. In the coloured spectrum, no one can say where one colour ends and where its neighbour begins, yet any one may distinguish its different colours, the violet from the blue, the blue from the green, each from its neighbour, and every one from the other. So in diseases having an affinity, when they approach each other they cannot easily be distinguished, whilst, in their general character, it would be difficult to mistake them."

The varieties and specimens of morbid growths, to which I have alluded, either single or when blended together, and under their different modifications, exhibit the extraordinary and inscrutable vagaries of nature; and whilst we wonder at and admire her inimitable constructions, according to the standard of perfection, still, in her unhappy and morbid deviations, she no less excites the study of the medical philosopher, and does not cease to be equally interesting even when perverted and diseased.

Surgical Operation for the removal of Osteo-sarcomatous Tumours from the Jaw.

It may be assumed that we do not at present know of any medical application, either external or internal, that is a cure for this class of malignant diseases; it is therefore worse than a waste of time to try any such remedy, to the neglect of a timely operation, after the nature of the disease is ascertained. In fact, there is no cure except extirpation of the tumour, and total excision or destruction of the part in which it originates. Some *curative* attempts have been made, by endeavouring to cut off the supply of blood going to these tumours, upon the same principle as to some other parts of the body; but they have not been found generally successful, chiefly owing to the very free anastomoses of the arterial communications of the head. It has, however, been said, that the disease has been *arrested* by ligature of the common carotid; but Mr. Liston states, "the allegation is not borne out by facts, nor is it easy to discover on what principle the practice was adopted. Such a result is not to be expected *a priori,* nor to be believed without further trial." (I may observe, by the way, that the probable effects of tying the carotid artery is a subject of very extended interest in various other affections of the head and brain.)

In the removal of malignant growths, I am aware it is a rule of practice to extirpate not only the diseased mass, but as much as is practicable of the surrounding parts that may be suspected of contamination; and that in those instances where amputation is adopted, to amputate at a distance from the seat of the disease; but, unfortunately with respect to tumours of the face, we are so limited, that it is scarcely possible to go beyond the disease; consequently, the almost only resource left, is to remove the tumour, and endeavour to destroy the surface of the parts to which it is attached, as completely as possible, with the view of totally obliterating the origin of its growth.

With regard to the mode for removal of diseased portions of the cheek and jaw bones, and also for amputation at the joint, I need only to refer for directions to the operation described for the case, which has been the subject of this paper. It may be desirable, however, to pause here a little, for the purpose of making a few practical observations, which may, perhaps, be worthy of the notice of the profession generally. I allude to the preliminary operation of tying the carotid trunk, or its branch the external, on account of the dread of hæmorrhage; the danger of which seems to have engaged very seriously the utmost attention of every operator who has undertaken this department of surgery, before proceeding to the removal of tumours of the face and jaw, and which, by those who have adopted or recommended the practice, seems to be considered quite a subordinate and inferior proceeding, both as to its dangers and difficulties. This appears a grand mistake; unless it can be shown, that it is *necessary* to run this greater risk, to secure the patient's safety, I am strongly inclined to reverse the position, from every principle of anatomical and surgical science; and to consider the first or preliminary operation not only, as a general measure, unnecessary, but as being more dangerous than that which is denominated the second or main operation, and, likewise, as eventually endangering its success; and I have reserved to this place the reasons for illustrating and supporting the view which I am disposed to suggest and recommend in reference to this important part of practice I have taken the trouble of very accurately referring to almost every published case on this subject that has been operated upon, in which the common or external carotid artery has been secured, before proceeding to the removal of the tumour, or had a ligature of reserve passed under it, and ultimately tied. In this survey, references to which will be given at the conclusion of this paper, only two or three cases have succeeded; and even in those, it may be presumed, that previously tying the artery might have been better avoided; the rest not only proving unsuccessful, but evidently fatal, from the effects of the preliminary operation, and not from the second or chief operation, as it is termed. In those instances where the carotid has been tied, as a preparatory measure, by talented and dexterous surgeons, they have had the candour, so desirable and creditable to the profession, to confess, afterwards, that "difficulties," "unusual difficulties," "very embarrassing," obstacles occurred in endeavouring to embrace the artery. One gentleman, Dr. Stedman, in the Edin. Med. Surg. Jour. No. 110, mentions, that he spent "fiftyfive minutes in securing this vessel, and forty-eight more in completing the other or second operation." What is still more worthy of remark is, that it appears the *design* of his first operation was not obtained, as he states that, "notwithstanding the ligature of the common carotid artery, several arteries sprung in the course of the dissection, so that he had, altogether, to tie seven." This case happily succeeded, to reward both the patient and surgeon, after an operation that occupied one hour and three quarters. The exemplary candour which pervades the whole statement of this communication, is highly creditable to the operator. In another case in the same work, No. 112, it is stated that "the common carotid artery was tied as a preparatory step to extirpating the tumour. When the tumour was removed, there was a sudden gush of blood from a number of vessels, particularly about the angle of the jaw, where some large arteries required to be tied, notwithstanding the common carotid being previously secured. Head-ache, teasing cough, mucus troublesome to spit up, intermitting pulse, stupor, and death, followed on the fourth day after the operation. The brain not examined."

In a very interesting case that came under my notice, as assistant, at an operation on a youth between 15 and 16, with an osteo-sarcomatous tumour of the size of an orange, arising from the alveolar depressions of the lower jaw, of about three or four months' duration; the health of the patient not being impaired, several portions of the tumour had been, two or three times previously, removed from within the mouth, which only aggravated its growth, by stimulating the activity of the vessels. In consequence it was determined to remove it from without; and that, previously, the common carotid should be tied, both to act as a tourniquet to repress hæmorrhage, and also to prevent, if possible, the future growth of the tumour, in case there should be any disposition to a renewed production after extirpation. The artery was consequently secured, and the diseased portions of the lower jaw were removed; both these operations were dexterously executed, occupying, together, nearly three quarters of an hour. Every thing went on favourably for about seven weeks, when, without any evident cause, whilst the patient was sitting up in bed, a gush of blood, about a pint, suddenly jetted from the wound over the artery. The patient did not faint, but felt sunk by the sudden loss of so much blood. The next day, whilst he was sitting up and sucking a bit of orange, another burst took place, in rather a larger quantity, and instantly ceased. The patient fainted. Great difficulty in swallowing followed, with discharge of a quantity of grumous blood from the mouth. Two days after, hæmorrhage again occurred, from which he never rallied. The following day, a slight bleeding returned, and the patient died soon afterwards. The hæmorrhage was found, on inspection, to have arisen from the upper orifice of the artery, as may be readily anticipated; as it can scarcely be expected that so large an artery, and so near the heart, could remain open without an immediate loss of blood, that must instantly have emptied its left ventricle, and destroyed the patient. In four other cases reported in the Medical Gazette and Lancet, within the last year and a half, as occurring in the London Hospitals, in all of which the common or external carotid artery was tied, only one has proved successful; and in that case I particularly beg to remark that the external carotid was the vessel previously secured. In all those instances, only portions of one jaw were removed.

It is quite refreshing to turn from these unfortunate results, to report, from the 83rd No. of the Ed. Med. and Surg. Journal, a very severe case, nearly as extensive as that with which I have commenced this paper, under the management of Mr. John Irving, in which the tumour was successfully removed without tying either of the trunks. The operation was attended with but slight hæmorrhage, "two or three buccal arterial branches only requiring ligature." In this fortunate case, "the whole of the superior maxillary bone, excepting the nasal, orbitary, and a portion of the malar processes, was completely removed by absorption. The tumour was found of large dimensions, occupying one-half of the face, and extending into the cavity of the mouth, exhibiting there the appearance of a mushroom, or cauliflower, expanding out into irregular tuberosities. It was studded, throughout its substance, by many minute spiculæ of bone, which communicated a gritty sensation to the fingers. On handling the tumour, it was found heavy, and of a dense firm texture, not unlike a scirrhous liver; in fact, the term hepatization might convey a tolerable idea of the physical consistence of the tumour. The patient's general health had suffered much, and her fate, before the operation, appeared sealed and fast approaching."

The design of collecting these important facts, and the conclusions to be drawn from them, will be at once obvious, as they evidently involve several very grave questions as to future proceedings in cases of this nature; more particularly with respect to the dread and danger of hæmorrhage, on removing tumours of this description. I shall, therefore, submit a few practical observations on this branch of operative surgery. To establish the possibility of passing a ligature around the primitive carotid, was reserved for this age, and, for the honour of British surgery, through the energy and high talents of Sir A. P. Cooper and the late Mr. Abernethy. Accident and necessity often lead to discovery, by which we arrive at principles of the greatest magnitude; so has it proved in this instance. In 1804, Mr. Abernethy, it is well known, was suddenly called upon to tie the common trunk of the carotid, in a case of extensive lacerated wound of the neck by a cow's horn, where the internal carotid and the chief branches of the external carotid, were wounded. The patient died in thirty-six hours after. Professor S. Cooper, under whose notice the case fell, gives it as his opinion, that the man died more from the great quantity of blood which he lost, and the severe mischief done to the parts in the neck, than from any effect of the ligature of the artery on the brain.

Nov. 1, 1805.—Sir A. P. Cooper,* seizing upon all the previous facts, and in opposition to the general received theories and alarm, lest the functions of the brain should be either destroyed or fatally disturbed, in consequence of instantly cutting off this portion of supply of blood to the head, was the first surgeon who ventured to pass a ligature round this great arterial trunk for the cure of aneurism. The twelfth day from the operation, the ligature came away. On the twenty-first the patient died. The cause of death was attributed to "the inflammation of the aneurismal sac and the parts adjacent, by which the size of the tumour became increased so as to press on the pharynx and prevent deglutition, and upon the larynx, so as to excite violent fits of coughing, and, ultimately, to impede respiration." Permission was not granted to examine the brain.

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* See Med. Chir. Trans. vol. i.

In 1808, Sir Astley, in another case of aneurism of the neck, successfully tied the carotid artery. This was the first life saved in a disease which had hitherto proved uniformly fatal; and I wish particularly to draw attention to this distinguished surgeon's opinion, at that period, on the subject, as it tends very strongly to establish one of the important positions I had in view in preparing this paper. "I had no apprehension of the functions of the brain sustaining any permanent injury from a ligature on the carotid artery, having the evidence of Dr. Baillie to prove, that one carotid had been entirely obstructed, and the diameter of the other considerably lessened in the same person, without any apparent ill effects. I have also given a drawing, in my former paper, of the left carotid artery being obstructed by the pressure of an aneurism of the aorta; and we have the analogy of animals to show, that *both carotids may be tied without any visible effect upon the functions of the nervous system.*"

Since this first and great triumph over disease, which Mr. Hodgson observes may justly be regarded as one of the greatest improvements in modern surgery, this artery has been very frequently tied with various degrees of success, and is now, by every surgical author, familiarly ranged with the other operations upon the great arterial trunks.

On a review of these facts, which have completely destroyed the old physiological notions respecting the supply of blood to the brain, and have been the means of introducing new and correct knowledge of the innumerable anastomoses by which the circulation is carried on, it might be expected that an improved treatment would have been established for the various diseases of that most important and governing organ, which has been beautifully described by the poet as the "dome of thought and the palace of the soul." *These facts prove that the free anastomoses by which the carotids communicate together and with the vertebral arteries, are so numerous and so direct, that when one of these great vessels is tied, the circulation, both within and without the cranium, does not appear to suffer the slightest derangement.* In fact, after this operation, little derangement of the brain manifests itself; for, even on throwing an injection into one of the carotids, or the subclavian, we see it pass into all the arteries of the opposite side of the head. Physiologists have also repeatedly tied the two common carotids, at the same time, in living animals, without the functions of the brain appearing to suffer the slightest interruption. In a very interesting case of melancholic insanity, given by Mr. Hodgson, where the patient stabbed herself in the neck, ultimately producing an aneurismal tumour of the carotid, and for which that vessel was tied with success, it is observed, "no change was perceived in the state of the patient's mind after this operation; she still remained melancholy and dejected."

By those who reflect on this statement, and take a comprehensive survey of the force and distribution of the blood to the different parts of the body, it will at once be observed that, whilst only one arterial trunk is devoted to each extremity of the body, the head has not only four large trunks destined to its preservation and use, but that they arise almost immediately from the heart, and derive all the increased impulse which their direct connection with that organ insures. From these considerations, in addition to the others which have been referred to, it appears that if one, or even both, of the carotids are obliterated, no instant or sensible impression is made upon the brain; hence can it be presumed that, under similar circumstances, any other part of the head, or any new or additional growth, should feel its influence? It may further be considered that, in proportion as you diminish or obliterate the flow of blood through one carotid, an increased quantity is immediately impelled into the other trunks. If, in contrast, you place a ligature on either of the large trunks going to an extremity, there is, generally, if not immediately, a sensible alteration in the limb, both as to temperature and feeling, and which is, sometimes, followed by gangrene, and even the death of the patient. But what surgeon now dreams of any of these results, upon taking up one or more of the trunks going to the head.

Notwithstanding this representation, I am fully aware that it is still customary to propose tying the carotid trunk, previous to the immediate removal of tumours of the neck and face, to guard against hæmorrhage; and, also, as a curative process alone, by merely depriving them of their due proportion of blood, as has been instanced in Mr. Travers's brilliant operation for the cure of aneurism by anastomosis in the orbit. This was the second instance in which the carotid artery was tied for aneurism. In this case, the operation may be admitted to have exhibited some influence in controlling that disease. But, as Mr. Burns very properly remarks, we have, as yet, too few instances of success to authorise us in forming a decided opinion. Now, although Mr. Travers, in his very interesting history of this case, terms the risk "*moderate,*" of placing a ligature on the carotid artery, yet, even in this instance, the irritation the ligature excited produced a succession of alarming symptoms, and had very nearly proved fatal to his patient. It also appears that but little impression was made, by this well designed operation, on the disease for five months; it may, therefore, be doubted whether the ultimate recovery of this patient may not be mainly attributed to an excessive hæmorrhage, that subsequently took place from the uterus after a miscarriage, producing syncope and great debility, for "*on the following morning it was observed that the upper tumour was flattened, and the pulsation had altogether ceased.*" Mr. Hodgson, also, mentions "that the diminution of the tumour was very remarkable, after violent discharges of blood from the uterus."

In another case by Mr. Wardrop,* of a subcutaneous nævus on the left cheek of an infant, six weeks old, of a very unusual size, this justly eminent and scientific surgeon determined on tying the common carotid trunk as a means of cure. In stating the immediate effects of the operation, he informs us that it produced "no change in the child's countenance, but, in a very few hours, there was a manifest alteration in the appearance of the tumour. It became soft and pliable, lost its purple colour, and the tortuous veins collapsed." This favourable effect continued to increase for a day or two, but on the "fourth day after the operation, the tumour had considerably increased in bulk, the integuments covering it had become livid, and the adjacent veins turgid." On the twelfth day, the tumour had again put on more favourable appearances; but on the next day, the child became suddenly weaker, and died on the fourteenth day after the operation, "exhausted by the irritation of an ulcer which had now involved the whole surface of an enormous tumour." Mr. Wardrop, on reviewing the history and treatment of this case, offers some general rules for the management of this species of tumour.

These two highly interesting cases, under the management of very eminent surgeons, will not, I presume, be considered conclusive, or as opposing my views on this subject.

I feel pleasure in referring to another instance. I allude to "Mr. Dalrymple's case of aneurism, by anastomosis, in the left orbit, cured by tying the common trunk of the left carotid artery;" recorded in the 6th vol. of the London Med. Chir. Trans. I extract the leading facts of this case. The effects of the operation were immediate and decisive. As soon as the ligatures on the carotid artery were tied, the pulsatory motions of the tumours on the forehead and cheek entirely ceased, the redness became paler, and the surface shrivelled. The patient afterwards suffered severe constitutional disturbance from the irritating effects of the ligature, attended with alarming consecutive hæmorrhage, but from which she ultimately escaped, and "recovered after a period of 103 days from the operation."

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* Med. Chir. Trans. vol. ix. part 1.

I trust that I may be allowed to digress here, for the purpose of remarking upon the coincidence, that in both this case and Mr. Travers's, anastomotic aneurism not only existed during pregnancy, but was evidently connected with and influenced by that state; and I have just observed that Mr. Hodgson mentions that the diminution of the tumour, in the case before alluded to, was very remarkable, after violent discharges of blood from the uterus. It may be added that some tumours of this description have, as it is termed, spontaneously disappeared; in fact, it has been stated that the whole pathology of this class of morbid growths, is not explicable by any thing hitherto ascertained respecting their unnatural structure. On this very obscure subject, I take leave to refer the reader to a paper on nævi materni, recently inserted by Mr. Lawrence, in the 13th vol. of the Med. Chir. Trans. It is there intimated that some of the phenomena of these subcutaneous nævi resemble those of the "tissu erectile." The various points of resemblance in these productions to the human placenta, to the spleen, to the corpus cavernosum penis, and corpus spongiosum urethræ, and, lastly, to the comb and wattles of the fowl tribe, shew that no accurate knowledge exists on the subject.

It would be a culpable omission in this review of some of the important cases in surgery, not to notice, particularly, "Mr. Goodlad's case of a tumour successfully removed from the left side of the face and neck, the carotid artery being previously tied," inserted in the 7th vol. of the Med. Chir. Trans. This case has made not only a considerable impression upon the profession generally, but the distinguished operator has drawn conclusions from it which, it is presumed, are open to quite a different construction. Mr. Goodlad commences by observing, that he believes "*there is no instance on record, of the carotid artery being secured by ligature, in order to render the removal of a tumour practicable,*" &c.; again, "*the extent of the disease here became of less importance, if the carotid artery were previously secured;* the question then turned on the propriety of tying the carotid artery." This was determined on, and in effecting this preliminary operation, very considerable difficulties were encountered, and "*more violence was done to the vessel than was desirable.*" On performing the second operation for the removal of the tumour, "the hæmorrhage was considerable; each stroke of the knife was followed by a gush of blood, and, occasionally, in a tremendous stream, besides a general oozing." Very severe local and constitutional symptoms followed. At the end of ten weeks the wound was healed, and the patient dismissed. Unfortunately the cure was not permanent, the disease returned, and, fifteen months after the operation, the poor woman died. Mr. Goodlad remarks that, "on the seventh day after the operation, the pulsation, in the right carotid, extends to the left side, and that of the left subclavian seems to be communicated to the vessel which has been tied, and excites suspicion of its being still pervious." He then adds, "I know of no case, where the disease was at all comparable in extent, with a similar result. The rapidity of the growth of the tumour shews its extreme vascularity, and the flow of blood was so considerable, even with the carotid tied, as to convince me, if the subject had previously admitted of a doubt, that the most dexterous operator could not have completed it, without that preparatory step. It was not merely the security which was thus afforded to the operator, but the chance of the tumour being re-produced was also lessened; for, if any portion of the diseased structure escaped observation, by cutting off so directly the flow of blood, there was great reason to conclude it would die from mere exposure."

"A question would arise from this view, as to the propriety of merely performing the preparatory operation, and leaving the diseased mass to slough away."

The following is a note appended to this case.

"In a similar case, especially if the tumour were well defined, the operation would be much simplified, if, instead of tying the artery, the surgeon were to cut down upon, and command the current of blood through it, by an assistant pressing it either upon the vertebræ, or between his finger and thumb, until the tumour were removed, and the divided branches secured."

The profession, I am sure, are greatly indebted to Mr. Goodlad, for presenting a case so highly instructive, so full of useful fact and observation; and he has the delightful satisfaction of reflecting that all the resources of surgical art were exhausted in this instance. If the carotid artery had not been tied, he might since have regretted it; but the case, altogether, tends to set at rest the much agitated question, concerning the repullulation of tumours in the neck and face; inasmuch as we have the declared fact that after obliterating this great trunk, the growth of the tumour was renewed.

Upon a calm review of this case, I am much inclined to vary in opinion from Mr. Goodlad, and some other very high authorities, on the propriety of tying the common carotid previous to the removal of tumours in the neck, &c. &c. with the view of averting a fatal hæmorrhage. In fairness I ought rather to say that Mr. Goodlad himself, if not originally doubtful on this question, seems subsequently somewhat to have modified his opinion. I shall, however, on this subject, combine this gentleman's views with those of Mr. S. Cooper, who, in his Surgical Dictionary, page 1126, 6th edition, thus introduces the subject. "Respecting the foregoing severe operation, many surgeons may be inclined to doubt the propriety of tying the carotid artery as a preparatory step; and, indeed, it is positively condemned in an anonymous note attached to the above case; simple temporary pressure on the exposed vessel being represented as preferable. It appears to me, however, that Mr. Goodlad's method was justifiable, and, on the whole, the best, because the application of the ligature to the carotid not only removed the dangers of hæmorrhage, during the operation, but obviated them afterwards, and, no doubt, lessened the necessity for a prodigious number of ligatures, for vessels which would otherwise have poured out a profuse quantity of blood." Much other valuable information follows this extract on the subject of tumours, to which I am desirous of referring the reader.

From Mr. Goodlad's own report, I think it will even appear that tying the carotid had not any sufficient influence to countenance the future adoption of this measure, for it is stated, after *having tied the carotid, that "each stroke of the knife was followed by a gush of blood, and, occasionally, in a tremendous stream :"* and, again, "*the flow of blood was so considerable, even with the carotid tied,* as to convince me, if the subject had previously admitted of a doubt, that the most dexterous operator could not have completed it without that preparatory step. It was not merely the security which was thus afforded to the operator, but *the chance of the tumour being reproduced was lessened.*" Mr. Goodlad also observes that, on the 7th day after the operation, "*the pulsation in the right carotid extends to the left side, and that of the left subclavian seems to be communicated to the vessel which has been tied, and excites suspicions of its being still pervious.*"

From the analysis of this statement, it may be concluded,

1. That tying the primary carotid artery had no influence in repressing the excessive hæmorrhage which took place.

2. That it did not prevent the re-production of the tumour.

3. That it did not prevent the collateral and anastomosing branches from conveying, through the medium of the right carotid and vertebral arteries, refluent blood to the left carotid, to such a degree as to "*excite suspicion of its being still pervious.*"

If further proof were wanting with respect to the propriety of removing large and vascular tumours of the neck, *without tying* the carotid artery, I need only refer to the same work, in which two cases are given, one by Mr. Vincent, of St. Bartholomew's Hospital; the other by Mr. Barlow, of Blackburn. In both these formidable instances of large tumour, the propriety of tying either the common or external carotid is not mentioned. Both cases recovered. In Mr. Barlow's case, "a profuse hæmorrhage followed each cut of the scalpel, and a sudden death like syncope seized the patient, which continued for the space of several minutes, accompanied with a feeble tremulous pulse, cold sweats, ghastly countenance, and suspended respiration. After securing several arteries with ligatures, the wound was dressed and the patient conveyed to bed. *Little or no constitutional disturbance took place during the progress of the cure,* and the woman returned home to her family, completely well, in three weeks after the extirpation of the tumour. Nine months after the operation, there appears no indication of the disease being re-produced. The nature of the tumour seemed, to all the medical gentlemen present, to partake of that character designated 'medullary sarcoma,' and bore a great affinity to the brain both in colour and texture." In this very conclusive case, it appears that securing the *individual arteries that are immediately going to the tumour,* as they are divided by the knife, is not only sufficient and practicable, but, it may be presumed, a much more likely means of preventing its re-production, because *the scalpel divides, and, by that means, detects every vessel going to nourish the tumour.*

In another large tumour involving the parotid gland, and connected with the transverse process of the atlas, the basis of the skull, the meatus auditorius, mastoid process, and angle of the jaw,—the operator, Mr. Carmichael, of Dublin, succeeded in suppressing an alarming gush of blood, by securing the arteries going to the part. This was a very alarming case of hæmorrhage; it, however, had a successful termination. Mr. Carmichael, at the conclusion of the history, remarks that, if he were called upon to perform such an operation again, he would, in the first instance, pass a ligature under the carotid trunk, which might be *tightened or not,* as occasion should require.—Cooper's Dictionary, p. 1126, 6th ed.

The precautionary measure of passing an untied ligature under the artery, may be adopted; but, notwithstanding this judicious suggestion, I am quite inclined to believe that the recovery of Mr. Carmichael's patient is attributable to the omission of tying the carotid artery.

A very interesting case, accompanied with "*Observations on the Pathology of Osteo-sarcomatous Tumours*" of the lower jaw, is given by Mr. Crampton, with valuable references by the editor, in the 12th vol. of the Lancet, p. 499.

M. Beclard, in removing the parotid gland surrounded with a great mass of disease, unfortunately divided the *external* carotid, or one of its branches, close to its origin. I merely refer to this extreme and desperate case, to *prove the practicability of tying this trunk, when wounded, and which was effected, in this instance, with success.*

I cannot conclude, for the present, these miscellaneous cases, without referring to a very *early* instance of this disease, in a child, four years old, under the care of Dr. Duffin, of Edinburgh. The disease originated in the lower jaw, and had ulcerated the inferior maxillary artery, producing sudden hæmorrhage to the amount of nearly three pints. The carotid artery was tied. The patient died four days after. Upon inquiry, it appeared that this patient had suffered excruciating agony in the situation of the disease, for a period of more than three weeks; but, as this was *considered to arise from tooth-ache or gumboil,* no advice was taken. On a post-mortem examination, upon cutting into the tumour, it was found to contain about three ounces of grumous blood, *the sac being formed by the periosteum.* In all probability this case might have had a more favourable issue, could the nature of the disease have been ascertained at an earlier period; but, unfortunately, it was incurable before advice was sought for.*

I shall now quit this brief analysis of cases, (in which, no doubt, many are omitted equally deserving of notice, and which I hope hereafter to be enabled to collect,) for the purpose of introducing a valuable extract from Mr. Hodgson's work on aneurism, (a 2nd edition of which, with additional plates, is earnestly expected and desired by the profession,) quite appropriate to the principal object I have in view. "The functions of the brain which are so indispensable to the economy, that nature appears to have provided it also with a *double circulation,* that its supply of blood may not suffer even a momentary interruption from the obstruction of one or more of its main arteries. *The blood is distributed to the brain in such a manner, as to guard against the effects of obstruction in one or more of its principal arteries.* This arrangement is rendered more necessary, from the slight degree of enlargement of which its arteries are capable, in consequence of their passage through bony canals. The transmission of the blood to the brain, through four large arteries, appears to effect this object, and to supply that organ with a larger quantity of this fluid than is indispensable for the due performance of its functions. It is an ascertained fact, that the vital functions are not in the least impaired by the obliteration of one or more of these channels, for *the trunks inosculate with each other so freely within the skull, that one of the main arteries will readily supply the whole. If coarse injection be thrown into one carotid, it will not only fill all the arteries of the brain, but will pass down the opposite carotid and the vertebral into the aorta and subclavian arteries. Again, if the subclavian artery be injected, the wax will pass by the vertebral artery through the same communications, not only into the opposite vertebral, but also into the carotid arteries. Physiologists have repeatedly tied both carotid arteries, in brutes, at the same time, and yet the functions*

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* Lancet, vol. i. p 539.

of the brain have not appeared to suffer the slightest interruption; and the common carotid has now been repeatedly tied, with perfect success, in the human subject, for the cure of aneurisms. The branches by which the two carotid arteries anastomose with each other, and with the subclavian arteries, in some degree supply this deficiency, by transmitting a stream of blood into the superior portion of the obliterated vessel. I have not hitherto been able to ascertain, by experiment, whether the brain will be sufficiently supplied with blood through anastomosing channels, when its four trunks, namely, both the carotid and both the vertebral arteries, are tied at the same time."

From all these considerations, it appears that a free and undisturbed collateral circulation is provided for the brain, in the event of one or more of its main arteries being obliterated, without the occurrence of those changes in their minute ramifications, which take place after the ligature of an artery, in most other parts of the body.

It may, therefore, be assumed, from all these important facts and anatomical investigations, that the advantages expected to be derived from tying the primary carotid in tumours of the head and face, are not realised to the extent that has been imagined, however beneficially the practice may be adopted, with respect to tumours situated in other parts of the body. The free communications between the several arteries of the head, both within and without the cranium, cannot, it seems, be destroyed, nay, scarcely in any degree be diminished, by tying either one or more of its great trunks; and the slight diminution that may, in some favourable and singular instances, be obtained, is not sufficient to warrant putting a patient under so fearful and dangerous an operation, as immediately preliminary to another capital operation for dissecting away any description of tumour from the neck or face; for, although Sir A. Cooper's operation has disproved the supposition of injury to the brain on cutting off one of its large trunks, still the carotid artery remains equally exposed to all the other dangers which ensue on tying any of the first order of arteries. One of its greatest dangers is the risk of the ligature being forced off, in consequence of its close vicinity to the heart. This danger is greater than seems generally to be considered; it is one which cannot ever, by any means, be got rid of, and which did not escape the anxious observation of Sir A. Cooper, who states, "I thought it proper not to run the risk of a hæmorrhage by dividing the artery, as *I was fearful the ligatures would be thrown off by the force of the heart*," &c.

This eminent surgeon then mentions another dangerous symptom which actually did occur, and to which this operation will always be exposed, as may be easily proved by reference to every carotid artery case; "as soon as the threads were tied, the patient was *immediately seized with a fit of coughing which I thought would have terminated her existence.*" And ultimately it did tend to bring about that fatal catastrophe.

Another danger to which this artery, in common with every great vessel, is exposed, when tied, and which appears to have been much overlooked by those who have adopted the preliminary operation, is the severe constitutional irritation which, more or less, constantly attends the application of the ligature, and which has proved so fatal in many instances.

Another and still greater danger that particularly attends the tying this artery, and, in a greater or less degree, that of every vessel in proportion to its situation and near vicinity to the heart, is consecutive hæmorrhage. I have already illustrated this fatal consequence in the result of the operation upon the case I have recorded in this paper, and at which I was present. This very instructive case did not fail to make its due impression upon me at the time; as the operation appeared itself to produce the fatal result, which, as a preliminary step, it was undertaken to avert. On that occasion, after due reference to authority, and after proper consultation and deliberation, the practice was deemed warrantable; and I am prepared to take my full share of being a willing accessary to the decision. I scarcely need repeat that the patient died of secondary hæmorrhage, supervening upon the minor, or preparatory operation, as it is termed. This, however, in all the instances to which I have referred, has proved most serious and important; and it ought, indeed, to be considered the greater or major operation.

This comprehensive anatomical and surgical survey of cases and facts, leads, it is presumed, to the important conclusion, that tying the primary carotid artery is to be considered as unadvisable, as a preliminary step, in the removal of tumours about the head, neck, and face; and that such a proceeding is only to be recommended as positively necessary in attempting the cure of aneurism of either of its trunks.

This deduction is evidently at variance with the prevailing practice amongst several of the first surgeons of the present day; and, in consequence of the influence of their opinions and example, it has become nearly a common rule, whenever a tumour about the neck or face, of any magnitude, is to be extirpated, to proceed, unhesitatingly, in the first instance, to tie the common carotid artery. It is to guard against the prevalence of this, in some instances, inconsiderate, and too general practice of causing a patient to undergo two severe and dangerous operations, that so extensive an analysis of facts and surgical operations has been entered into; the real and sole design of which is to bring before the profession this, as it may be termed, double operation, on an extensive scale, and in all its bearings, and with the hope of obtaining and establishing, from a fuller and larger collection of facts and opinions, the most accurate principle of practice, with respect to the single or double operation.

In calling the attention of the profession to this important subject, viz. the extirpation of malignant tumours of the head and face, it is presumed that the question of the two conjoint operations for their removal, has been sufficiently considered; that of first passing a ligature round the primary carotid trunk with the view to control hæmorrhage, and immediately after proceeding to dissect out the morbid growth.

I shall now offer some remarks upon another modern operation, adopted and recommended by several of our most scientific surgeons for the cure of tumours of the head and face. It is proposed to cut off or diminish the supply of blood destined to their nourishment, by tying the common carotid trunk, and by that means either to retard their future increase, or altogether gradually to diminish, and, finally, destroy them. The object of this truly ingenious practice is, by tying the carotid trunk, to try whether stopping this large supply of blood to the diseased parts, may not be followed by an absorption of the tumour. Some facts, appertaining to this question, are noticed under the article "aneurism by anastomosis," in Cooper's Dictionary, p. 183, 1127, 6th ed. It will there be seen that this operation does not permanently repress the growth of a tumour of this kind, even when it has this effect at first. This uncertainty will, no doubt, incline many practitioners to prefer the bold or ordinary method of extirpation. Yet, others will perceive that such an operation, notwithstanding its success in a few examples, is dreadfully severe, and must, of itself, in the generality of cases, have fatal consequences. They will also be encouraged to try the effect of the ligature, by the cure which Sir A. P. Cooper accomplished, of an enormous cutaneous enlargement of the lower extremity, by tying the artery in the groin. Indeed, I am sure that, as the improvements in modern surgery advance, the plan of curing tumours by cutting off their main supply of blood, will be much more extensively adopted than has hitherto been the case. In this way the surgeon may attempt the dispersion of many tumours, which could not be meddled with in any other manner, and which, if left to themselves, must have a fatal termination.

To Sir A. P. Cooper, Mr. Travers, Mr. Wardrop, and Mr. Lawrence, are we principally indebted for the introduction of this operation of tying the trunks of arteries going to tumours, with the sole view of cutting off their due supply of blood, as a means of destroying their existence. Herein is a strong instance of the happy effects of one great improvement leading to another. Aneurism of the carotid artery had been considered a most hopeless disease, till Sir A. P. Cooper established its cure by ligature. Mr. Travers availing himself of this fact, in less than a year after repeated and confirmed its important advantages, in the case of aneurism by anastomosis, to which I have alluded in the early part of this paper. This case is particularly interesting in a double point of view, not only on account of its being the second instance in which the carotid artery was successfully tied, but also as extending its merits to another class of diseases; and likewise as introducing to the notice of the profession the foundation of a more decided and scientific mode for the treatment of tumours, by cutting off their main supply of nourishment.

With respect to this mode of curing that *peculiar* tumour termed " aneurism by anastomosis," the subject is so fully before the profession in the several writings of these distinguished surgeons, throughout the different volumes of the Med. Chir. Trans. that I shall not further allude to them, having already drawn some inferences from those valuable communications. It is to be hoped that those gentlemen will continue to follow up their views, and gratify the profession by future reports. But, I may be permitted to remark, that the facts already before the profession, prove its advantages to be but of an equivocal, doubtful, or mixed character. Even Mr. Lawrence seems unsettled in his opinion on this subject in tumours of the head, as he observes, "the proceeding of tying the arterial trunk or trunks that supply the tumour, can be applicable to very few instances only. Perhaps the free communications between the several arteries of the head may render the carotid an unfavourable vessel for the experiment." Med. Chir. Trans. vol. xiii. part 2, page 426; also, Mr. Brodie's successful case, Med. Chir. Trans. vol. xv. part 1.

The same circumstances that render tying the carotid artery unfavourable, as a preliminary measure to prevent a fatal hæmorrhage, previous to the removal of a tumour, are in full force relative to this proceeding, on account of the universal anastomosis that takes place amongst the vascular trunks going to the head and brain. Its application to any other description of tumours, and to those situated in other parts of the body, becomes quite another question, and is likely to be attended with much more success. See Sir A. P. Cooper's case of an enormous cutaneous enlargement of the lower extremity, cured by tying the artery at the groin; also extirpation of the thyroid gland.—Cooper's Dictionary, p. 1095.

In reference to tumours *generally* of the neck and face, to which I am desirous of confining these remarks, my views may be collected from the various reasonings on the anatomical and surgical facts that have been produced in the course of this paper. From these facts there is the most direct and positive proof, that it is impossible to destroy the full and free arterial anastomosis, by tying one, or even more, of the great trunks. To think otherwise is as great a mistake as was formerly made in supposing the functions of the brain would cease upon tying one of the trunks. If, however, it should be ascertained that tying the common trunk has any sufficient, direct, and durable impression upon the growth of a tumour, or could exercise any decisive influence in the suppression of hæmorrhage, it might, even then, be inferred to be worse than a dangerous operation in another point of view; for it would appear to be a necessary conclusion from such premises, that an alarming change or disturbance would inevitably, at the same time, take place in the functions of the brain. The moment the free circulation through one trunk is interrupted, diminished, or disturbed, that instant an increased counteracting impulse is communicated to the others, for the purpose of re-establishing the momentary change that takes place; for it seems that the infinite inosculations cannot be interrupted but for a short period, by tying the common vessel; neither can the natural partnership that exists between them be dissolved. This fact is corroborated by almost every operator, as it is generally observed that upon tying one trunk, the others immediately beat with increased force. In Mr. Goodlad's case this was so manifest, that he suspected the tied artery was still pervious. In Mr. Travers's case it is mentioned that the carotid of the opposite side contracted with more than ordinary force. This naturally increased impulse given to the other trunks, and rousing in them accelerated arterial action, is a subject that has not received all the consideration it deserves. I shall not, however, dwell upon that point. It is, nevertheless, altogether a mistake, to conceive that tying one great trunk can destroy or interrupt, in any sufficient or durable degree, the circulation. If, however, it should, for an instant, derange or diminish the current of blood, still that current would very soon, by its own natural provision, be re-established, and, for a time, at least, with increased force; for it may be assumed, as a principle, that you cannot, by such means, destroy the natural tendency to form anastomosis, designed for the preservation of the arterial circulation, of this most essential and governing part of the system.

Having attentively perused the numerous cases and facts that have been collected and brought forward indiscriminately, and having also witnessed serious, nay, fatal effects, arising from tying the common carotid artery, as a preliminary operation to another that is immediately to follow, with the design of controlling dangerous hæmorrhage, and the reproduction of the disease, I may be allowed to conclude:—

1. That the preparatory operation of tying the primary carotid artery, is not only, as a general principle, unnecessary, but should be discountenanced as a proceeding of great, and, indeed, of far greater danger than the second operation; namely, that of removing the tumour, with the necessary portions of diseased bone, in cases of osteo-sarcoma of the jaw.

2. That there is every pathological reason for concluding that, in the great majority of cases that have been referred to, where the double operation has been performed, the result has proved fatally

detrimental to the patient ; and that this is solely to be attributed to the superadded operation of tying the common trunk.

3. That all the most extensive and extreme cases that have been *singly* operated upon, that is, without tying the carotid artery, have escaped a fatal hæmorrhage, and have, at least, recovered from the effects of the operation, even where the final event has been fatal.

4. That where the double operation has been performed, it has, in some instances, been followed by consecutive hæmorrhage, of which the patient has died, thereby causing the fatal event which it was designed to avert.

Lastly, not only is it proved that the removal of the tumour, with the diseased portions of bone, is an inferior and less dangerous operation than tying the carotid artery, but that it is an operation that may be extended to both jaws and bones of the face with less constitutional disturbance than has been apprehended ; in fact, that almost the entire of one side of the bones of the face may be safely amputated, and the patient still be able to perform the functions of mastication and articulation, accompanied with but slight deformity.

With reference to the very ingenious proposition that has, in a few instances, been adopted, and which deserves very attentive consideration, namely, that of simply tying one carotid trunk, with the view of cutting off the supply of blood going to tumours generally ; there is not, in our present state of knowledge, any reason to be too confident of its success. With respect to the few very interesting and puzzling cases, that have been brought forward by some of our best surgeons, of that peculiar disease termed "aneurism by anastomosis," in which this operation has been performed, the evidence as to its success is both scanty and inconclusive.

Although it has been inferred that tying one out of the four *common* trunks going to the head, has not any sufficient influence in controlling hæmorrhage, or preventing the reproduction of tumours, in consequence of the universal anastomosis established for the preservation of the functions of the brain; it still remains to be considered how far cutting off, by ligature, the supply of blood by *individual, given* arteries, to particular parts, may be more successfully applied towards the cure of tumours. I may here observe, that where this principle has been kept in view, or acted upon, it has, more or less, proved successful; as is instanced in Mr. Scott's case at the London Hospital. There the *external* carotid was selected and tied. This important question, together with some further practical remarks on the origin and classification of tumours, will form the subject of another communication.

It may, however, in conclusion, be observed, that such is the strong nature of the anastomosing principle in the organs of animals, and more particularly in the head, that it is one of the most difficult to destroy amidst all the great and wonderful functions of the living machine.*

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* Since this paper was printed off in proof, my attention has been directed to a most important communication published in 1824, by Mr. Adams, in the Trans. of the King's and Queen's Coll. Phy. Ireland,

I learn that the disease returned in this patient, some time after she left the infirmary; that she languished for about a twelve-month and died; and, that she could not be prevailed upon to return to the hospital; if she had returned, it would have been my wish to have tried the full effect of the actual cautery.

Although the patient did not eventually recover, yet, as she lived sufficiently long to prove, to a certain degree, the success of the operation, I trust the facts, and the extreme and peculiar features of the case, may still be deemed worthy of the attention of the Association, for, in the language of the late Mr. Abernethy, "I always like cases, I consider that they impress the mind more forcibly than mere words. It is said that history is a mode of teaching philosophy by a recital of facts."

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which, it seems, has accidentally escaped Mr. Cooper's usual fidelity in recording valuable facts, no notice being taken of it in the 6th edition of his Dictionary, published in 1830. This omission will be admitted in some degree, as my excuse for having overlooked so appropriate and valuable a confirmation of one of the chief points of practice introduced by myself. Mr. Adams's communication contains two cases of successful removal of *two large malignant tumours,* one weighing 5lbs. 7ozs. *being larger than the head of the patient, without tying the carotid artery.* These cases are accompanied with many interesting and sound pathological, anatomical, physiological, and surgical remarks, supporting, to the very utmost, the views I have taken on this subject; and quite sufficient to have superseded, in some respects, the introduction of ~~my~~ this paper. I feel, however, a most gratifying pleasure in offering my humble testimony in support of that gentleman's judicious and convincing reasoning and practice, in this department of operative surgery; and of being, in any degree, the means of drawing additional attention to the writings of this distinguished surgeon.

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No. 77, Mr. Liston.
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Vol. 12, p. 394. Mr. Wardrop.
Vol. 12, p. 499, Mr. Crampton.
Vol. 12, p. 620, Dr. Ballingal.
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Vol. 2, p. 1, Mr. Travers.
Vol. 6, p. 111, Mr. Dalrymple.
Vol. 7, pt. I, p. 112, Mr. Goodlad.
Vol. 9, pt. 1, p. 199, Mr. Wardrop.
Vol. 9, pt. 11, p. 203, Langstaff.
Vol. 12, pt. 1, p. 247, Mr. Vincent.
Vol. 15, pt. 1, p. 177, Mr. Brodie.
Vol. 16, pt. 1, p. 19, Mr. Barlow.
Vol. 13, pt. 11, p. Mr. Lawrence.

For the drawing from which the plate was taken, I am indebted to Mr. Jones Smith, a gentleman who also favoured me with his attendance, (with about sixty other professional friends) at the operation; and from whom the surgeons of the infirmary, on many other occasions, have received similar proofs of his taste and skill as an amateur artist.

In submitting this imperfect and hastily prepared case for insertion in the "*Transactions of the Provincial Medical and Surgical Association,*" the Author takes leave to congratulate the Members of the Association on the production of its first volume; and, also, on the facilities which the establishment of this Institution will afford for the more rapid and extensive communication of medical information among the profession generally. It is hoped that the reflection of how much information has been lost, and suffered to run to waste, for want of a general depôt, which might have afforded a durable asylum and existence to valuable facts and observations, will animate the Provincial Profession to see their real interest and dignity in their true light.

The Provincial Medical Press has, of late years, exhibited unquestionable proofs of the respectable state of Medical and Surgical Science in the Provinces. The establishment of Provincial Medical and Surgical Schools; of Public Medical Libraries; and local Medical Societies, has now become so general, as to give a vast impulse and advancement to Medical Literature; a subject not only of the highest interest and comfort to the Profession itself, but, what is of still greater importance, to society at large.

Association and Publication are the simple elements of our new-formed Society, which, I trust, will, both in its infancy and future growth, be emulous of being worthy to share, in the well-earned fame of its professional predecessors in the Metropolis, and that it will ever study to cultivate and extend their well-designed improvements, for the honour of the profession and the benefit of mankind.

W. HETLING.

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